

REMARKS

This application has been reviewed in light of the final Office Action dated September 1, 2005. In view of the foregoing amendments and the following remarks, favorable reconsideration and withdrawal of the rejections set forth in the Office Action are respectfully requested.

Claims 1 and 3-21 are pending. Claim 18 has been amended to attend to formal matters. Claims 1, 12 and 18 are in independent form.

Claims 1, 3-11 and 18-21 were rejected for obviousness-type double patenting over claims 1-11 of U.S. Patent No. 6,910,760 B2 (*Kubota et al.*).

Claims 12-17 were indicated as provisionally rejected for obviousness-type double patenting over claims 12-14 of copending application no. 10/614,029.

Applicants respectfully traverse these rejections.

In regard to the rejection of Claims 12-17, Applicants note that application no. 10/614,029 is the application from which *Kubota et al.* issued, and the Office Action is therefore mistaken in stating that application no. 10/614,029 is copending. Moreover, Applicants note that claims 12-14 of application no. 10/614,029 were canceled during prosecution; neither these claims nor any other method claims appear in the issued patent. Accordingly, Applicants submit that the double patenting rejection of Claims 12-17 over application no. 10/614,029 is in error and respectfully request its withdrawal.

In regard to the rejection of Claims 1, 3-11 and 18-21, Applicants respectfully submit the following remarks.

Independent Claim 1 recites, *inter alia*, that a cross-sectional area of an upper surface (of a second bubbling chamber) with respect to a central axis of the second bubbling chamber is greater than a cross-sectional area of a discharge port portion with respect to a central axis of the discharge port portion.

Applicants submit that at least this feature of Claim 1 is not obvious over claims 1-11 of *Kubota et al.* In that regard, it is noted that *Kubota et al.*'s claims 1-11, and in particular *Kubota et al.*'s claims 1 and 2 (cited by the Office Action as corresponding to Applicants' Claim 1), include no subject matter pertaining to or suggesting the relative sizes of (cross-sectional areas of any portions of) the second bubbling chamber and the discharge port portion. It is noted that *Kubota et al.*'s claim 4 recites that "a wall face of said discharge port portion is provided with a taper of 10° or less to the plane orthogonal to the main surface of said element base plate." However, *Kubota et al.*'s claims do not specify the direction of the taper (hence, do not specify whether the discharge port portion increases or decreases in the direction going away from the second bubbling chamber). Moreover, *Kubota et al.*'s claims do not specify whether the discharge port portion (or a cross-sectional area thereof) is smaller or larger than the second bubbling chamber (or a cross-sectional area of the upper surface thereof). While certain of *Kubota et al.*'s figures (e.g., Fig. 4) may show that the discharge port portion is smaller than the second bubbling chamber, it is noted that this subject matter of *Kubota et al.*'s disclosure is not claimed and it is understood that this subject matter is not to be read into *Kubota et al.*'s claims.

Independent Claim 18 recites, *inter alia*, that (1) a cross-sectional area of a first bubbling chamber, taken in a plane parallel to a main surface of an element substrate, is larger than a cross-sectional area of a second bubbling chamber, taken in a plane parallel to the main

surface of the element substrate, (2) the cross-sectional area of the second bubbling chamber, taken in the plane parallel to the main surface of the element substrate, is larger than a cross-sectional area of a discharge port portion, taken in a plane parallel to the main surface of the element substrate, and (3) each of (a) a connecting portion between a side wall surface of the first bubbling chamber and a side wall surface of the second bubbling chamber and (b) a connecting portion between a side wall surface of the second bubbling chamber and a side wall surface of the discharge port portion has a stepped portion.

Applicants submit that at least these features of Claim 18 are not obvious over claims 1-11 of *Kubota et al.*

In regard to (1), it is noted that *Kubota et al.*'s claims 1-11, and in particular *Kubota et al.*'s claim 1 (cited by the Office Action as corresponding to Applicants' Claim 18), include no subject matter pertaining to or suggesting the relative sizes of (the cross-sectional areas of) the first and second bubbling chambers. Although *Kubota et al.*'s claim 1 recites that the sectional area of the upper face of the second bubbling area is smaller than the sectional area of the lower face of the second bubbling chamber, and the sectional area is continuously changed from the lower to the upper face of the second bubbling chamber at an inclination of 10 to 45° (claim 2), *Kubota et al.*'s claims do not specify whether the (cross-sectional area of the) first bubbling chamber is larger or smaller than the (cross-sectional area of the) second bubbling chamber.

In regard to (2), it is noted that *Kubota et al.*'s claims 1-11, and in particular *Kubota et al.*'s claim 1 (cited by the Office Action as corresponding to Applicants' Claim 18), include no subject matter pertaining to or suggesting the relative sizes of (cross-sectional areas

of) the second bubbling chamber and the discharge port portion. This point has been explained above in the discussion of Claim 1.

In regard to both (1) and (2), again as discussed above with respect to Claim 1, while certain of *Kubota et al.*'s figures may show relative sizes of the first and second bubbling chambers, and of the second bubbling chamber and the discharge port portion, it is noted that this subject matter of *Kubota et al.*'s disclosure is not claimed and it is understood that this subject matter is not to be read into *Kubota et al.*'s claims.

In regard to (3), it is noted that *Kubota et al.*'s claims 1-11, and in particular *Kubota et al.*'s claim 1 (cited by the Office Action as corresponding to Applicants' Claim 18), include no subject matter pertaining to or suggesting a connecting portion between side wall surfaces of the first and second bubbling chambers having a stepped portion, or a connecting portion between side wall surfaces of the second bubbling chamber and the discharge port portion having a stepped portion. It is noted that *Kubota et al.*'s claim 1 recites that "on the circumferential portion of the upper face of said first bubbling chamber . . . and in contact with the opening communicated with said second bubbling chamber, an extrusion is formed continuously to surround said opening

...." An example of the extrusion is illustrated as element 33 in Fig. 4 of *Kubota et al.* However, it is understood that the recited extrusion is not a stepped portion.

In sum, Applicants submit that at least the above-noted features of independent Claims 1 and 18 are not included in, suggested by, or rendered obvious by the claims of *Kubota et al.* Accordingly, the double patenting rejection of Claims 1 and 18 is believed to have been overcome and is respectfully requested to be withdrawn. As discussed above, the double

patenting rejection of independent Claim 12 is also believed to have been overcome and is respectfully requested to be withdrawn.

A review of the other art of record has failed to reveal anything which, in Applicants' opinion, would remedy the deficiencies of *Kubota et al.*, against the independent claims. Those claims are therefore believed patentable over the art of record.

The other claims in this application are each dependent from one or another of the independent claims discussed above and are therefore believed patentable for at least the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual reconsideration of the patentability of each on its own merits is respectfully requested.

Applicants submit that this Amendment After Final Rejection clearly places the subject application in condition for allowance. This Amendment was not presented earlier, because Applicants believed that the prior Amendment placed the subject application in condition for allowance. Accordingly, entry of the instant Amendment, as an earnest attempt to advance prosecution and reduce the number of issues, is requested under 37 C.F.R. § 1.116.

In view of the foregoing amendments and remarks, Applicants respectfully request favorable reconsideration and early passage to issue of the present application.

Applicants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,



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